이차식을 완전제곱식으로 변환하는 연습문제
(Practice problems converting quadratic expressions to perfect squares)

Practice problems converting quadratic expressions to perfect squares

Start End

Practice problems converting quadratic expressions to perfect squares

Step Up

Step Down

Next Exercise

2 Step

$$-x^2 + 2x + 1$$

Solution

Practice problems converting quadratic expressions to perfect squares

Step Up

Step Down

Next Exercise

2 Step

$$-x^2+2x+1$$

Solution

$$\begin{aligned}
&-\left(x^2-2x\right)+1\\
&=-\left\{x^2-2\cdot 1x+1-1\right\}+1\\
&=-\left\{x^2-2\cdot 1x+1\right\}+1\times 1+1\\
&=-(x-1)^2+2
\end{aligned}$$

Practice problems converting quadratic expressions to perfect squares

Step Up

Step Down

Next Exercise

3 Step

$$x^2 - 2x - 1$$

Solution

Practice problems converting quadratic expressions to perfect squares

Step Up

Step Down

Next Exercise

3 Step

$$x^2 - 2x - 1$$

Solution

$$\begin{aligned} & \left(x^2 - 2x\right) - 1 \\ = & \left\{x^2 - 2 \cdot 1x + 1 - 1\right\} - 1 \\ = & \left\{x^2 - 2 \cdot 1x + 1\right\} - 1 \times 1 - 1 \\ = & (x-1)^2 - 2 \end{aligned}$$

Practice problems converting quadratic expressions to perfect squares

Step Up

Step Down

Next Exercise

3 Step

$$-x^2 - 2x + 3$$

Solution

Practice problems converting quadratic expressions to perfect squares

Step Up

Step Down

Next Exercise

3 Step

$$-x^2 - 2x + 3$$

Solution

$$\begin{aligned} & -\left(x^2 + 2x\right) + 3 \\ = & -\left\{x^2 + 2 \cdot 1x + 1 - 1\right\} + 3 \\ = & -\left\{x^2 + 2 \cdot 1x + 1\right\} + 1 \times 1 + 3 \\ = & -(x+1)^2 + 4 \end{aligned}$$

Practice problems converting quadratic expressions to perfect squares

Step Up

3 Step

Step Down

Next Exercise

$$-2x^2 + 2x - 2$$

Solution

Practice problems converting quadratic expressions to perfect squares

Step Up

Step Down

Next Exercise

3 Step

$$-2x^2 + 2x - 2$$

Solution

$$\begin{aligned}
&-2\left(x^2 - x\right) - 2 \\
&= -2\left\{x^2 - 2 \cdot \frac{1}{2}x + \left(\frac{1}{2}\right)^2 - \left(\frac{1}{2}\right)^2\right\} - 2 \\
&= -2\left\{x^2 - 2 \cdot \frac{1}{2}x + \left(\frac{1}{2}\right)^2\right\} + 2 \times \frac{1}{4} - 2 \\
&= -2\left(x - \frac{1}{2}\right)^2 - \frac{3}{2}
\end{aligned}$$

Practice problems converting quadratic expressions to perfect squares

Step Up

Step Down

Next Exercise

4 Step

$$-4x^2 - 2x - 2$$

Solution

Practice problems converting quadratic expressions to perfect squares

Step Up

Step Down

Next Exercise

4 Step

$$-4x^2 - 2x - 2$$

Solution

$$-4\left(x^2 + \frac{1}{2}x\right) - 2$$

$$= -4\left\{x^2 + 2 \cdot \frac{1}{4}x + \left(\frac{1}{4}\right)^2 - \left(\frac{1}{4}\right)^2\right\} - 2$$

$$= -4\left\{x^2 + 2 \cdot \frac{1}{4}x + \left(\frac{1}{4}\right)^2\right\} + 4 \times \frac{1}{16} - 2$$

$$= -4\left(x + \frac{1}{4}\right)^2 - \frac{7}{4}$$

Practice problems converting quadratic expressions to perfect squares

Step Up

Step Down

Next Exercise

5 Step

$$-5x^2 + 4x - 1$$

Solution

Practice problems converting quadratic expressions to perfect squares

Step Up

Step Down

Next Exercise

5 Step

$$-5x^2 + 4x - 1$$

Solution

$$-5\left(x^2 - \frac{4}{5}x\right) - 1$$

$$= -5\left\{x^2 - 2 \cdot \frac{2}{5}x + \left(\frac{2}{5}\right)^2 - \left(\frac{2}{5}\right)^2\right\} - 1$$

$$= -5\left\{x^2 - 2 \cdot \frac{2}{5}x + \left(\frac{2}{5}\right)^2\right\} + 5 \times \frac{4}{25} - 1$$

$$= -5\left(x - \frac{2}{5}\right)^2 - \frac{1}{5}$$

Practice problems converting quadratic expressions to perfect squares

Step Up

Step Down

Next Exercise

6 Step

$$5x^2 + x + 5$$

Solution

Practice problems converting quadratic expressions to perfect squares

Step Up

Step Down

Next Exercise

6 Step

$$5x^2 + x + 5$$

Solution

$$5\left(x^2 + \frac{1}{5}x\right) + 5$$

$$= 5\left\{x^2 + 2 \cdot \frac{1}{10}x + \left(\frac{1}{10}\right)^2 - \left(\frac{1}{10}\right)^2\right\} + 5$$

$$= 5\left\{x^2 + 2 \cdot \frac{1}{10}x + \left(\frac{1}{10}\right)^2\right\} + 5 \times \frac{1}{100} + 5$$

$$= 5\left(x + \frac{1}{10}\right)^2 + \frac{99}{20}$$

Practice problems converting quadratic expressions to perfect squares

Step Up

Step Down

Next Exercise

7 Step

$$-7x^2 - 6x + 4$$

Solution

Practice problems converting quadratic expressions to perfect squares

Step Up

Step Down

Next Exercise

7 Step

$$-7x^2 - 6x + 4$$

Solution

$$-7\left(x^2 + \frac{6}{7}x\right) + 4$$

$$= -7\left\{x^2 + 2 \cdot \frac{3}{7}x + \left(\frac{3}{7}\right)^2 - \left(\frac{3}{7}\right)^2\right\} + 4$$

$$= -7\left\{x^2 + 2 \cdot \frac{3}{7}x + \left(\frac{3}{7}\right)^2\right\} + 7 \times \frac{9}{49} + 4$$

$$= -7\left(x + \frac{3}{7}\right)^2 + \frac{37}{7}$$

Github:
https://min7014.github.io/math20240325001.html

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